

1995

AMERICAN TRAVEL SURVEY

AN OVERVIEW OF THE SURVEY
DESIGN AND METHODOLOGY

INTRODUCTION

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) created the Bureau of Transportation Statistics (BTS) in the Department of Transportation (DOT). In December of 1992, the BTS was formally established to compile, analyze and publish statistics; to develop a long-term data collection program; to develop guidelines to improve the credibility and effectiveness of the DOT's statistics; to represent transportation interests in the statistical community; and to make statistics accessible and understandable. At about the same time, the Transportation Research Board of the National Academy of Sciences in its report, *Data for Decisions: Requirements for National Transportation Policy Making*, concluded that the biggest gap in the DOT's intermodal data program was in "flow data." The most recent source of data on passenger flows dates back to the 1977 National Travel Survey, conducted by the Bureau of the Census as a component of the quinquennial Census of Transportation.

To meet the need for passenger flow data, the BTS conducted the 1995 American Travel Survey (ATS). The ATS field work was performed by the Census Bureau, under its authority to conduct a Census of Transportation as stated in Title 13 of the U.S. Code. In the future, BTS plans to conduct the survey every five years.

This paper describes the methods used in the 1995 ATS. The introduction provides an overview of the purpose and objectives of the survey followed by a description of the survey and sample designs, survey field operations, and processing of survey data. The intention of this paper is to provide a reference to data users that will aid in the analysis of the data when they become available.

A. SURVEY OBJECTIVES

The American Travel Survey was designed to obtain information about long-distance travel of persons living in the United States. The information is needed to identify characteristics of current use of the nation's transportation system, forecast future demand, analyze alternatives for investment in and development of the system, and assess the effects of Federal legislation and Federal and state regulations on the transportation system and its use.

Economic activity generated from people traveling represents one of the largest and most rapidly

growing industrial sectors in the United States. In many areas of the country, travel-related services form the primary industries for providing income and jobs for many of its residents. In view of the importance of travel and transportation to the economic and social well-being of America, comprehensive and timely data relating to this sector are essential to government, private industry, and others responsible for policy formation and promotional activities in the general field of travel and tourism.

The main objective of the ATS is to provide policy makers with more accurate and comprehensive information than has previously been available about the travel of persons and households in the United States and about the principal characteristics of travel and travelers. The survey will provide key data



to assist in the formulation and evaluation of initiatives in intermodal transportation. Because policy-makers have a particular interest in understanding the differences in travel patterns by state, the ATS will provide detailed information on state-to-state travel as well as travel to and from metropolitan areas by mode of transportation. Data will also be available for subgroups defined in terms of characteristics related to travel, such as business, vacation or combined/business pleasure travel by age, family type, labor force status and income. Subgroups of special interest may include, for example, frequent travelers, trips taken by children traveling without a parent, and trips taken by retirees.

To achieve survey objectives, both cross-sectional and longitudinal estimates were needed. Key cross-sectional estimates include the origins and destinations of trips, the proportions of people traveling on various transportation modes, intermodal connections, reasons for trips, trip duration, trip distance, and person and household characteristics that may influence aggregate travel demand during a particu-

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lar time period. Longitudinal estimates require the collection of information about travel behavior or the members of households and persons over the entire survey year. For example, it may be desired to measure the cumulative effect of patterns of travel on the transportation system or the patterns of change in travel by season.

B. SURVEY AND SAMPLE DESIGN

1. Survey Design

ATS uses a quinquennial design, collecting data for calendar years ending in zero and five. A sample of households was selected at the beginning of calendar year 1995. Interviewing of households in the 1995 survey, which contained about 80,000 eligible addresses, began in April 1995 and ended in March 1996. Sample households were interviewed four times during this period, at approximately three-month intervals.

The survey was based on a probability sample of households from each of the 50 states and the District of Columbia. The survey population for ATS consisted of persons resident in households and persons living in group quarters, such as dormitories, rooming houses, religious groups dwellings, and family-type housing on military bases. Persons living in military barracks and in institutions, such as prisons and nursing homes, were excluded.

2. Sample Design

Sample selection for ATS was based on lists of addresses compiled by the Census Bureau from the decennial censuses of population. In addition to the ATS, the Census Bureau uses address-based lists to provide samples for all of its major household surveys, including the Current Population Survey, National Crime Survey, and the American Housing Survey.

After the sample of addresses was selected for the ATS, rules were established to determine which persons should be included in initial interviews at those sample addresses. At the initial interview, all persons whose usual residence was the sample address were included and remained in sample as long as they remained at the sample address. Persons who left the survey population through death, going abroad, or changing residence to another address were considered ineligible for subsequent interviews. How-

ever, information about trips taken up until the time a respondent became ineligible was collected. Persons who moved into the original sample address after the initial interview were interviewed and a series of brief questions was asked about all trips taken since January 1, 1995. This retrospective travel information was used to make weighting adjustments in the annual estimates.

Households not interviewed for any reason during a particular interview period were contacted and interviewed at a subsequent time and asked about travel taken during the missed travel quarter. Because the recall period was longer for these few respondents, trip information was limited to the number of trips, mode of transportation for each trip, primary purpose of each trip, and the origin and destination of each trip. Again, the retrospective



information on these trips are used only to make adjustments in annual data.

C. QUESTIONNAIRE CONTENT

Basic demographic characteristics and other classification variables associated with a household and its members were recorded during the initial interviews for the survey and were updated or verified in each subsequent interview. Social and economic characteristics included age, sex, marital status, race, household type, Hispanic origin, education, labor force status, and income. Detailed information about each trip taken by each member of the household was collected quarterly. The main trip characteristics included the purpose of trip, means of transportation, origin, destination, intermediate stops, travel dates, trip duration, number of nights away, and types of lodging used. Travel distances for each trip were assigned based on transportation network routing algorithms.

Household-level questions were asked only once for each household and were updated if necessary throughout the survey year. The detailed trip questions were asked of the initial respondent. If this respondent was knowledgeable about other household members' travels, he or she served as a proxy respondent for other household member's trips. Otherwise, the individual household member was contacted and interviewed. Trip characteristics were asked about each trip reported by the respondent for each member of the household.

D. DATA COLLECTION PROCEDURES

Interviews were conducted by Census Bureau field staff under the supervision of the Census Bureau's 12 permanent regional offices and by interviewers working under the supervision of the Census Bureau's three centralized telephone facilities. Most interviews were by telephone, either by field representatives working with laptops from their homes or by interviewers working with personal computers from centralized telephone facilities. Personal visit followups were used to obtain missing information for non-responding households. Completed interviews were transmitted electronically to Census Bureau headquarters from the field representatives' homes and from the centralized telephone facilities on a daily basis.

1. Basic Data Collection Features

The length of a household interview depended in part on the number of trips taken by the household members. The length of each quarterly interview for all households averaged 12 minutes. Interviews ranged from a low of 3 minutes to a high of just over two hours. Any person aged 18 and over who was present at the time of the interview could report for themselves and other household members unless not physically or mentally able to do so. Proxy responses were accepted for persons as long as the respondent was knowledgeable about the other household members' travels. Information for children was collected from a knowledgeable adult.

2. Data Collection Instruments

The primary data collection instrument for the ATS was an electronic questionnaire programmed for the computer in the CASES software language. At

the start of the first interview, the interviewer recorded the basic demographic characteristics for each person residing at the sample address, plus a few characteristics of the household and the housing unit. The telephone number and address were verified and recorded in case callbacks were needed to obtain additional information. The interview was conducted on a trip-by-trip and person-by-person basis until the questionnaire was completed for all trips taken by each household member.

Other instruments used in the data collection process were a series of advance letters and one phone call. These include a prenotice letter, survey package (letter, calendar/diary, and map), introductory telephone call, post cards to remind household members to continue to keep track of their travel information, and reminder letters.

The prenotice letter served as a notice to the respondent that the household was selected for the survey and provided general information about the survey. The letters carried the signatures of the Secretary of Commerce and the Secretary of Transportation. The survey package included a second letter containing more detail about the ATS with answers to some commonly asked questions. A travel calendar was included in the survey package. The calendar contained instructions on how to record travel information and space to record the details of travel taken during the travel period. The calendar was used as a recall aid and was not collected from the respondent.

After the survey package was mailed to sample households, a phone call was made to each household to describe the importance of the survey, to encourage participation, to explain what the respondents needed to do, and to answer questions. This phone call also served as a bounding technique to help the respondent recall travel taken since the telephone call. Reminder post cards were sent about half way through the three month travel period to remind respondents to fill in the calendar/diary if and/or when they travel. About four weeks prior to each subsequent interview, reminder letters were



sent to each household to remind the respondents to expect a phone call from an interviewer.

3. Data Collection Strategies

Several broad strategies were adopted in designing the data collection instrument and the interview process. Travel information was collected in chronological order from the beginning of the reference period (longer ago in time) to the time of the interview. In addition, for each trip reported, the question items were sequenced in roughly chronological order. For example, after the main destination and dates of a trip were obtained, the respondent was asked to report the mode of transportation, reason for the trip, travel partners, stops along the way to the main destination, type of lodging at the main destination, overnight side trips taken while staying at the main destination, and stops on the way home.

Since some trips are taken by more than one member of the household, information was collected about all trips taken by the respondent first. Next, questions were asked about trips taken by other household members, excluding trips already reported in order to avoid collecting redundant trips. The use of records, such as the calendar provided in the survey package, a personal calendar, receipts from airlines, trains, buses, hotels, etc., may have helped respondents to provide more accurate information. The use of a calendar and map was especially helpful in completing the detailed trip information. Interviewers were instructed to encourage respondents to take time to get their calendar or records for reference during the interview. In addition, interviewers were provided with a United States atlas for their own reference during the interview.

The measurement of trip mileage in the ATS was an important factor for at least two reasons: 1) to determine whether the distance traveled was sufficient to meet the 100 mile trip definition, (although ATS asks respondents to provide information on all trips of 75 miles or more, published data will include information only for those trips of 100 miles or more); and 2) to get an estimate of total miles traveled from origin to destination and return. The method of calculating trip and trip segment mileage consisted of computerized algorithms designed to estimate both great circle and transportation network distances using the respondent's reported origin and destination place names. Mileage estimates

based on the transportation network depend on mode of transportation, and information about stops made along the way.

4. Interviewer Characteristics, Training and Supervision

a). Interviewer characteristics

In April 1995, approximately 1,200 interviewers were hired and trained to work on the ATS. A large majority of the interviewers were women. The average monthly workload for the ATS was about 14,000 households. Interviewers typically completed most of their interviews during the first two weeks of each month of interviewing. Interviewers were paid on an hourly basis, receiving between \$8.00 and \$12.00 per hour.

b). Interviewer training

Training for ATS interviewers included home study, classroom training, on-the-job training and refresher training. Interviewers new to ATS received intensive training, including four hours of self-study and four days of classroom training as well as an additional six hours on listing operations. Training sessions included lectures, audio-visual presentations, mock-interviews, and classroom discussion. Trainees received detailed information about their jobs, the concepts and definitions used in the travel survey, and specific interviewing techniques. As part of the initial training, each interviewer practiced several interviews. Interviewers received training on new information and on special aspects of the survey as needed during the survey period. Interviewers found to be weak in certain aspects of the survey received supplemental training to help them meet response rate and accuracy standards.

c). Supervision and quality assurance

The work of the interviewers was monitored, and feed back was provided in several ways. The work of each experienced interviewer was observed by a supervisor who checked the interviewer's performance in establishing rapport with the respondents, asking questions in an appropriate manner, probing, and recording answers accurately. The results of the observations were discussed with the interviewers and interviewers whose performance was below standard had their work observed more often.

A systematic reinterview program served the dual purposes of checking a sample of the work of the in-

dividual interviewers and identifying aspects of the field procedures which may need improvement. The quality assurance reinterview sample covered about five percent of each interviewer's work each month. The reinterviews, which were completed as soon as possible after the original interview, were conducted on the telephone by a supervisor. The reinterviews were used to determine whether the interviewers conducted the interview at the correct address, classified noninterviews correctly and determined household composition correctly. Several trip questions were also checked to verify that the interviewer asked these items during the original interview. The results of the reinterview were used to take corrective action, such as supplemental training or termination.

E. PRODUCT PLANS

The data products from the 1995 ATS will provide national estimates, information on travel within and between census regions and divisions, information on state-to-state passenger travel, and travel to and from metropolitan areas. BTS will release the first ATS data products beginning in the summer of 1997. Public-use data tapes will be available on CD-ROM. Paper products will likely include reports showing household, person, and travel characteristics, travel profiles, and a chart book, among others. All ATS products will be available on the Internet.

F. CONCLUSION

To obtain more information about the American Travel Survey and its status, contact Susan J. Lapham, BTS Transportation Surveys and Program Manager, at 202 366-9913 or by e-mail at susan.lapham@bts.gov.

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